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No. XIV.

WIND-GAGE.

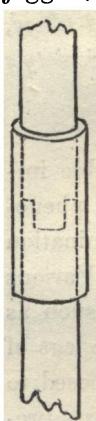
The SILVER MEDAL was voted to GEORGE EDWARDS, Esq., Lowestoff Harbour Works, for his Wind-Gage, a Model of which has been placed in the Society's Repository.

THE force of the wind is an element of considerable importance in the investigation of many atmospheric phenomena, and therefore any instrument for the determination of it with considerable exactness has its value. Various contrivances have been proposed for this purpose, such as the difference of elevation of a liquid in one of the legs of a syphon when the orifice of the other leg is exposed to the action of the wind; or a surface of a given area presented to the wind, and the amount of the pressure indicated by its re-action on a spring, a rack, or any other mechanical mode of measuring impulse.

Mr. Edwards's wind-gage is of this latter class, and is combined with a common movable index-vane, whereby the direction of the wind is also indicated.

In front of his house, Mr. Edwards has raised a mast nearly 40 feet high, so that the vane at its top is quite above the reach of eddies from the chimneys. The mast is fastened in two places to the side of the house by an iron strap with a binding screw, and the base of it is stepped into a wooden block called a tabernacle: in this it is retained by a strong transverse pin serving as a joint, and allowing the mast to be lowered to the ground by means of a tackle, the two binding screws being pre-

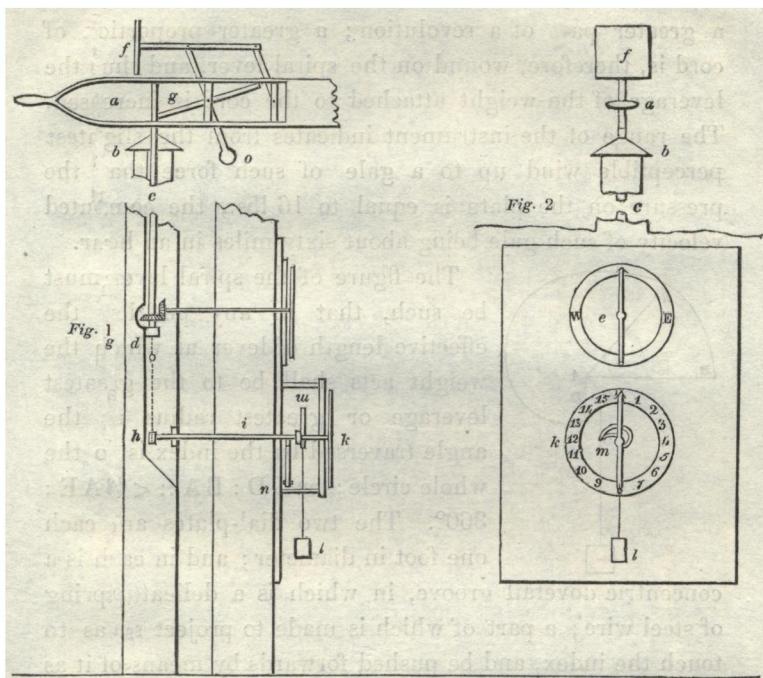
viously loosened. The mast is perforated through its axis for the admission of a spindle formed of half-inch iron gas-pipe in four lengths: to one end of each length a ferule is attached, into which the other end of the next length is inserted: the ends of the pipes are cut into corresponding joggles, as in the annexed figure. Just beneath each of



these joints is a staple through which the pipe passes, and it rests beneath in a socket, which allows it to turn on its axis. In figure 1, *a* is the vane, *b* is the top of the mast, *c* is the hollow spindle or pipe, which carries the vane; *d* is the socket which supports the bottom of the spindle, above which, surrounding the spindle, is a small bevel wheel: this bevel wheel takes into another, fixed at one end of a horizontal spindle, which passes through the wall of the house, and the opposite end of which terminates in the centre of a dial-plate *e*, and carries an index, shewing the direction of the wind as in the common index-vane. Fig. 2 is a view at right angles to the former, in which the same parts are indicated by the same letters.

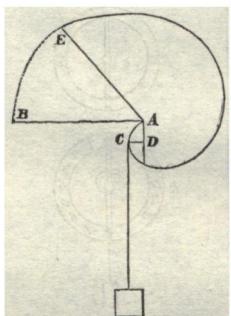
Having thus shewn those parts of the machine by which the direction of the wind is indicated, we proceed to describe those which shew the force of the wind, which is the chief matter of novelty in Mr. Edwards's apparatus.

f is a square plate of copper placed upright, and at right angles to the vane *a*; it will, therefore, always present itself at right angles to the direction of the wind. A straight bar, forming one arm of a crank, projects from the hinder part of the plate *f*; and to this is attached one arm of a second crank, in such a position that the end of the other arm of the same crank *g* shall move vertically whenever the first crank is moved horizontally by the



impulse of the wind on the copper-plate. The end of the arm *g* projects into a slit in the hollow shaft *c*, and is attached to a wire, which passes down the shaft, and terminates in a ring a little below the socket *d*. To the ring is hung a small chain or cord, which makes one turn round a pulley *h*, fixed on one end of a horizontal spindle *i*, to the other end of which is fixed the pointer, which traverses on the graduated circle *k*. The numbers on the circle indicate the pressure of the wind in pounds' weight on a copper-plate one foot square. On the same spindle *i* is hung a weight *l*, the cord of which falls into a spiral groove or lever *m*, which is also fixed on the spindle. The stronger the wind is the farther the copper-plate recedes before it, and consequently the horizontal spindle performs

a greater part of a revolution ; a greater proportion of cord is, therefore, wound on the spiral lever, and thus the leverage of the weight attached to the cord is increased. The range of the instrument indicates from the slightest perceptible wind up to a gale of such force that the pressure on the plate is equal to 16 lbs., the computed velocity of such gale being about sixty miles in an hour.



The figure of the spiral lever must be such, that in any position the effective length of lever at which the weight acts shall be to the greatest leverage or greatest radius as the angle traversed by the index is to the whole circle ; or $CD : BA :: \angle BAE : 360^\circ$. The two dial-plates are each one foot in diameter ; and in each is a concentric dovetail groove, in which is a delicate spring of steel wire ; a part of which is made to project so as to touch the index, and be pushed forwards by means of it as it advances. These springs, therefore, will indicate what has been the greatest motion of the hands in the night, or during the absence of the observer.

The weight n on the spindle i is intended to balance the spiral m ; and the weight o on the crank balances the weight of the wire attached to the end of g .

The entire cost of the apparatus was about ten guineas.

Lowestoff, 24th March, 1834.

THIS is to certify, that I have had frequent opportunities of observing the Wind Gage invented by Mr. George Edwards, and am of opinion, that it shews very accurately

the force of the wind under different circumstances, and that it has been in operation several months (during which time it has blown heavy gales of wind) without being in the slightest degree injured.

R. B. MATHEWS,

Lieutenant, Royal Navy.

Ivetsey Bank, Staffordshire,

SIR,

April 1, 1834.

HAVING, during my absence from home, heard from Mr. George Edwards, of Lowestoff, that he had transmitted to the Society of Arts a model of a new Wind Gage of his invention, I beg to trouble you with this communication, to state, that I have seen the said invention at work, and that it answers its purpose effectually in shewing the force and direction of the wind, and will, in either case, register the extremes, either of force or direction, in the absence of the observer.

Deeming this invention to be highly ingenious and useful, and deserving the notice of the Society of Arts,

I am, Sir, &c. &c.

W. CUBITT, Civil Engineer,

A. AIKIN, Esq.

16 Parliament Street, London.

Secretary, &c. &c.

CORRIGENDA IN FIRST PART OF VOL. L.

Page 11, 5 lines from bottom, for height, and place the connecting bar g, read height and place, the connecting bar g.

13, line 2, for ; then unclamp read , first unclamping.

14, 5 and 8, for b read l.

— 16, for lie read lies the bar.

26, 8, after grs. add of morphia.

33, 16, dele working.

39, 3, for latter read former.

— 10, after to add air and.

53, 8, 11, 27, 31, for bar or bars read arm or arms.

— 14, for 2 read 1.

55, 21, dele subsequently.

57, 14, dele and.

58, 3 from bottom, for c c, which is a front, read which is a front view, c c.

59, 5 from bottom, dele thrown back and, and insert the same in the next following line, after compartment.

63, 5, for covered read high-pressure.

69, 5 from bottom, for right angles read the angle.

84, 9, after horns insert e.

86, 12 from bottom, dele (as in figure 15).

90, 1 and 2, omit alternate.

— 6, omit half the planks retain their original thickness, and.

— 9, omit half.

91, 6 from bottom, after separate add in perspective.

—, last line, after Fig. 1 add the two other arms of this knee are horizontal, and at right angles to each other, one of them being parallel to the side of the ship, and the other perpendicular to it.

99, last line, for 1 read 2.

100, line 1, for 2 read 1.

108, 6 from bottom, read the first part of this sentence as follows :

A straight bar projects from the hinder part of the plate f, and to this is attached a crank g in such a position that the end of its lower arm shall move vertically whenever the bar attached to f is moved horizontally.

109, 4, for ring, twice repeated, read swivel.

110, 23, for the sentence the weight to end of g, substitute the weight l on the spindle i balances the spiral m, the weight o on the crank balances the copper plate and horizontal bar, and another weight at the right hand end of the bar g (not shewn in the engraving), balances the weight of the wire.

144, 4, after entire add machine.

155, 11 from bottom, for shave read have.